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09/913,501	08/15/2001	Takanori Yamashita	DAIN:646	9600

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EXAMINER	
KRUER, KEVIN R	

ART UNIT	PAPER NUMBER
1773	

DATE MAILED: 10/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/913,501	YAMASHITA ET AL.	
	Examiner	Art Unit	
	Kevin R Kruer	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *77-102* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *77-102* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 26, 2004 has been entered.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

4. The rejection of claims 89-99 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement has been overcome by amendment.

5. The rejection of claims 89-102 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement has been overcome by amendment.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 77 and 84 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow et al (US 5,134,046) in view of Steele et al (US 5,242,714).

Chow teaches a metallic foil covering for a battery (abstract). The foil comprises a metallic foil, a thermoplastic adhesive film, (col 1, lines 65+) and an optional protective layer on the surface of the metal foil opposite the thermoplastic adhesive (col 2, lines 36+). The thermoplastic adhesive (herein relied upon to read on the claimed "innermost layer") comprises any thermoplastic resin that adheres to the metal foil and is heat-sealable to the plastic battery housing (col 2, lines 5+). The metal foil is preferably aluminum (col 3, example 2).

Chow does not teach that the aluminum foil should be conversion coated prior to lamination. However, Steele teaches a process for forming a chromium/phosphate protective conversion coating on metal surfaces such as aluminum (abstract). The coating is applied by first applying a pre-treating solution comprising polyalkenylphenol and fluorine source (abstract). Then a conversion coating comprises a trivalent chromium component and a phosphate component (col 4, lines 24+). The coating protects the metal surface against corrosion and improved adhesion to coatings (col 2, lines 27+). The examiner notes that trivalent chromium phosphate results when

phosphate and trivalent chromium are combined. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the conversion coating taught in Steele to both sides of the metal foil taught in Chow. The motivation for doing so would have been to increase the foil's corrosion resistance and adhesion to coatings.

8. Claims 79, 81 and 82 rejected under 35 U.S.C. 103(a) as being unpatentable over Chow et al (US 5,134,046) in view of Steele et al (US 5,242,714), as applied to claims 77 and 84 above, and further in view of and further in view of Koike (US 4,664,994) and Fitko et al (US 4,156,672).

Chow in view of Steele is relied upon as above. Specifically, Chow teaches that any thermoplastic resin that adheres to the aluminum foil and is heat-sealable to the plastic battery housing may be used as the thermoplastic adhesive (col 2, lines 1+). Chow does not teach that the thermoplastic adhesive may comprise polypropylene. However, Koike teaches a jacket for a battery wherein the jacket comprises an inside contacting layer made of polyolefin (abstract). Polyolefins are utilized because of their excellent heat-sealing properties and acid resistance (col 2, lines 44+). Suitable polyolefins include polypropylene (col 2, lines 55+). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize polypropylene as the thermoplastic adhesive taught in Chow because Koike teaches polypropylene has been used equivalently in the battery jacket art as inner heat-sealable layers of multi-layered battery jackets. Furthermore, polypropylene has excellent a Chow also does not teach that the innermost layer may comprise two or

more layers: and adhesive layer and an innermost resin layer. However, Fitko teaches that carboxyl modified polypropylene resins can be utilized as adhesion promoters for laminating propylene resin to aluminum foil (col 1, lines 27+). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize an carboxyl modified polypropylene adhesive layer between the polypropylene innermost layer and the aluminum foil layer. The motivation for doing so would have been to increase adhesion between propylene and aluminum.

With regard to the limitations of claims and 81 and 82, the examiner takes the position that the method of making a product does not patentably distinguish the claimed product from a product rendered obvious by the prior art unless it can be shown that the claimed method of making the product inherently results in a materially different product. In the present case, there is no such showing. The examiner takes the position that he laminate rendered obvious by the prior art reads on the claimed laminates of claims 81 and 82 because the laminates comprise the same layers, the same relative orientation, and the same compositions as the claimed laminates.

9. Claims 79 and 83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow et al (US 5,134,046) in view of Steele et al (US 5,242,714), as applied to claims 77 and 84 above, and further in view of JP 8806781B (herein referred to as Mitsui), and Fitko (US 4,156,672).

Chow in view of Steele is relied upon as above, but does not teach that the thermoplastic adhesive may comprise propylene-ethylene-butene terpolymer. However, Mitsui teaches an adhesive composition useful for improving adhesion between

aluminum and polyolefins, such as the polyolefin utilized as the plastic battery housing. Said composition comprises a terpolymer of propylene-ethylene and butene (see abstract). The terpolymer comprises 0.1-10% ethylene and 1-30% butene. Thus, it would have been obvious to one of ordinary skill in the art to utilize the terpolymer as the thermoplastic layer taught in Chow because Chow teaches any thermoplastic layer which adheres to the metal foil and is heat sealable to the plastic battery housing may be utilized.

Chow also does not teach that the adhesive layer between the innermost layer and the adhesive layer may comprise acid-modified polypropylene. However, Fitko teaches that carboxyl modified polypropylene resins can be utilized as adhesion promoters for laminating olefin resin to aluminum foil (col 1, lines 27+). Thus, it would have been obvious to one of ordinary skill in the art to utilize carboxyl modified polypropylene between the innermost layer and the aluminum foil layer of the laminate taught in Chow. The motivation for doing so would have been to increase the adhesion between thermoplastic adhesive and aluminum.

With regard to the limitations of claims and 81 and 82, the examiner takes the position that the method of making a product does not patentably distinguish the claimed product from a product rendered obvious by the prior art unless it can be shown that the claimed method of making the product inherently results in a materially different product. In the present case, there is no such showing. The examiner takes the position that he laminate rendered obvious by the prior art reads on the claimed

laminates of claims 81 and 82 because the laminates comprise the same layers, the same relative orientation, and the same compositions as the claimed laminates.

10. Claims 86 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chow et al (US 5,134,046) in view of Steele et al (US 5,242,714), as applied to claims 77 and 84 above, and further in view of JP 75037688B (herein referred to as Sanyo).

Chow in view of Steele is relied upon as above. Specifically, Chow teaches any thermoplastic resin that adheres to the aluminum foil and is heat-sealable to the plastic battery housing may be used as the thermoplastic adhesive (col 2, lines 1+). Chow does not teach that the thermoplastic adhesive should comprise ethylene rich polypropylene. However, Sanyo teaches an adhesive agent for bonding polyolefin articles to metal surfaces (abstract). Said adhesive agent comprises propylene-ethylene copolymer having 2-15wt% ethylene. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the ethylene rich polypropylene taught in Sanyo as the thermoplastic adhesive taught in Chow. The motivation for doing so would have been to assure good adhesion to the polypropylene battery housing.

11. Claims 79 and 88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow et al (US 5,134,046) in view of Steele et al (US 5,242,714), as applied to claims 77 and 84 above, and further in view of JP 75037688B (herein referred to as Sanyo), and Fitko (US 4,156,672).

Chow is relied upon as above, but does not teach that the thermoplastic adhesive may comprise ethylene rich polypropylene. However, Sanyo teaches an

adhesive agent for bonding polyolefin articles to metal surfaces (abstract). Said adhesive agent comprises propylene-ethylene copolymer having 2-15wt% ethylene. It would have been obvious to one of ordinary skill in the art to utilize the terpolymer as the thermoplastic layer taught in Chow because Chow teaches any thermoplastic layer which adheres to the metal foil and is heat sealable to the plastic battery.

Chow also does not teach that the adhesive layer between the innermost layer and the adhesive layer may comprise acid-modified polypropylene. However, Fitko teaches that carboxyl modified polypropylene resins can be utilized as adhesion promoters for laminating propylene resin to aluminum foil (col 1, lines 27+). Thus, it would have been obvious to one of ordinary skill in the art to utilize carboxyl modified polypropylene between the innermost layer and the aluminum foil layer of the laminate taught in Chow because said composition is taught by Fitko to increase adhesion between propylene and aluminum.

With regards to the method limitations, the courts have held that the method of making the laminate does not differentiate the claimed laminate from the laminates rendered obvious by the prior art unless it can be shown that the method of making the laminate inherently results in a materially different product. The examiner considers the claims to be rendered obvious by the applied art because the laminate comprises the claimed layers comprising the claimed compositions.

12. Claims 78, 80 and 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noh (US 6,242,131) in view of Steele et al (US 5,242,714) and Bainbridge et al (US 4,002,502).

Noh teaches a battery jacket comprising at least three layers: an innermost hermetically sealing layer (understood to read on the claimed "innermost resin layer"), an aluminum layer, and a nylon outermost layer (understood to read on the claimed "base layer") (abstract). The aluminum sheet should have a thickness of 30-50um (col 3, line 30). Furthermore, an adhesive layer (herein understood to read on the "adhesive resin layer") may be applied between the innermost hermetically sealing layer and aluminum layer or outermost layer and aluminum, respectively (col 3, lines 40+).

Noh does not teach that the aluminum layer should be conversion coated prior to lamination. However, Steele teaches a process for forming a chromium/phosphate protective conversion coating on metal surfaces such as aluminum (abstract). The coating is applied by first applying a pre-treating solution comprising polyalkenylphenol and fluorine source (abstract). Then a conversion coating comprises a trivalent chromium component and a phosphate component (col 4, lines 24+). The coating protects the metal surface against corrosion and improved adhesion to coatings (col 2, lines 27+). The examiner notes that trivalent chromium phosphate results when phosphate and trivalent chromium are combined. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the conversion coating taught in Steele to both sides of the metal foil taught in Noh. The motivation for doing so would have been to increase the foil's corrosion resistance and adhesion to coatings.

Noh does not teach that the aluminum layer should comprise 0.3-9.0wt% iron. However, Bainbridge teaches an aluminum alloy comprising 0.5-10wt% iron (abstract).

Bainbridge teaches that such alloys have improved workability over aluminum (col 1, lines 6+). Thus, it would have been obvious to one of ordinary skill in the art to utilize an aluminum alloy comprising 0.5-10wt% iron as the aluminum layer taught in Noh. The motivation for doing so would have been to increase the aluminum sheet's workability.

13. Claims 78, 80, and 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow et al (US 5,134,046) in view of Steele et al (US 5,242,714) and Bainbridge et al (US 4,002,502).

Chow teaches a metallic foil covering for a battery (abstract). The foil comprises a metallic foil, a thermoplastic adhesive film, (col 1, lines 65+) and an optional protective layer on the surface of the metal foil opposite the thermoplastic adhesive (col 2, lines 36+). The thermoplastic adhesive (herein relied upon to read on the claimed "innermost layer") comprises any thermoplastic resin that adheres to the metal foil and is heat-sealable to the plastic battery housing (col 2, lines 5+). The metal foil preferably is aluminum (col 1, line 66) with a thickness of 10-100um (col 2, line 18).

Chow does not teach that the aluminum foil should be conversion coated prior to lamination. However, Steele teaches a process for forming a chromium/phosphate protective conversion coating on metal surfaces such as aluminum (abstract). The coating is applied by first applying a pre-treating solution comprising polyalkenylphenol and fluorine source (abstract). Then a conversion coating comprises a trivalent chromium component and a phosphate component (col 4, lines 24+). The coating protects the metal surface against corrosion and improved adhesion to coatings (col 2, lines 27+). The examiner notes that trivalent chromium phosphate results when

phosphate and trivalent chromium are combined. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the conversion coating taught in Steele to both sides of the metal foil taught in Noh. The motivation for doing so would have been to increase the foil's corrosion resistance and adhesion to coatings.

Chow does not teach that the aluminum layer should comprise 0.3-9.0wt% iron. However, Bainbridge teaches an aluminum alloy comprising 0.5-10wt% iron (abstract). Bainbridge teaches that such alloys have improved workability over aluminum (col 1, lines 6+). Thus, it would have been obvious to one of ordinary skill in the art to utilize an aluminum alloy comprising 0.5-10wt% iron as the aluminum layer taught in Chow. The motivation for doing so would have been to increase the aluminum sheet's workability.

14. Claims 87 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chow et al (US 5,134,046) in view of Steele et al (US 5,242,714) and Bainbridge et al (US 4,002,502), as applied to claims 78, 80, and 85 above, and further in view of JP 75037688B (herein referred to as Sanyo).

Chow is relied upon as above. Specifically, Chow teaches that any thermoplastic resin that adheres to the aluminum foil and is heat-sealable to the plastic battery housing may be used as the thermoplastic adhesive (col 2, lines 1+). Chow does not teach that the thermoplastic adhesive may comprise ethylene rich polypropylene. However, Sanyo teaches an adhesive agent for bonding polyolefin articles to metal surfaces (abstract). Said adhesive agent comprises propylene-ethylene copolymer having 2-15wt% ethylene. It would have been obvious to one of ordinary skill in the art

at the time the invention was made to utilize the ethylene rich polypropylene taught in Sanyo as the thermoplastic adhesive taught in Chow. The motivation for doing so would have been to assure good adhesion to the polypropylene battery housing.

15. Claims 89 and 100 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow et al (US 5,134,046) in view of Steele et al (US 5,242,714), Fitko et al (US 4,156,672), and Kawahara et al (US 4,828,136).

Chow teaches a method of making a metallic foil covering for a battery (abstract). The foil comprises a metallic foil, a thermoplastic adhesive film, (col 1, lines 65+) and an optional protective layer on the surface of the metal foil opposite the thermoplastic adhesive (col 2, lines 36+). The thermoplastic adhesive (herein relied upon to read on the claimed "innermost layer") comprises any thermoplastic resin that adheres to the metal foil and is heat-sealable to the plastic battery housing (col 2, lines 5+). The metal foil is preferably aluminum (col 3, example 2). The protective layer (herein relied upon to read on the claimed base layer) is applied to the foil during the foil lamination process (col 2, lines 36+).

Chow does not teach that the aluminum foil should be conversion coated prior to lamination. However, Steele teaches a process for forming a chromium/phosphate protective conversion coating on metal surfaces such as aluminum (abstract). The coating is applied by first applying a pre-treating solution comprising polyalkenylphenol and fluorine source (abstract). Then a conversion coating comprises a trivalent chromium component and a phosphate component (col 4, lines 24+). The coating protects the metal surface against corrosion and improved adhesion to coatings (col 2,

lines 27+). The examiner notes that trivalent chromium phosphate results when phosphate and trivalent chromium are combined. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the conversion coating taught in Steele to both sides of the metal foil taught in Chow. The motivation for doing so would have been to increase the foil's corrosion resistance and adhesion to coatings.

Chow also does not teach that an adhesive layer may be utilized between the thermoplastic adhesive and aluminum foil. However, Fitko teaches that carboxyl modified polypropylene resins can be utilized as adhesion promoters for laminating olefin resin to aluminum foil (col 1, lines 27+). Thus, it would have been obvious to one of ordinary skill in the art to utilize carboxyl modified polypropylene between the innermost layer and the aluminum foil layer of the laminate taught in Chow. The motivation for doing so would have been to increase the adhesion between thermoplastic adhesive and aluminum.

Chow also does not teach the method in which the protective layer, the carboxyl modified polypropylene layer, and the thermoplastic adhesive should be applied to said aluminum layer. However, Kawahara teaches that aluminum may be laminated to thermoplastic resin layers by various known methods such as hot melting, extrusion coating, sandwich lamination or dry lamination using an adhesive (col 14, lines 65+). If the adhesive is a thermoplastic resin, it can be co-extruded with the thermoplastic resin in the form of a laminate film and heat fused to the aluminum substrate. The film is passed through rolls and heated (col 14, lines 65+). Thus, it would have been obvious

to one of ordinary skill in the art at the time the invention was made to utilize any of the method disclosed in Kawahara to attach the protective layer, the carboxyl modified polypropylene layer, and the thermoplastic adhesive to the aluminum foil taught in Chow. The motivation for doing so would have been that such methods are known in the art for adhering thermoplastic films to aluminum foils. Thus, said methods are understood to be cost effective and could be practiced without modifying known apparatus.

16. Claims 90, 95, 97, and 100 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow et al (US 5,134,046) in view of Steele et al (US 5,242,714), Koike (US 4,664,994), Fitko et al (US 4,156,672), and Kawahara et al (US 4,828,136).

Chow teaches a method of making a metallic foil covering for a battery (abstract). The foil comprises a metallic foil, a thermoplastic adhesive film, (col 1, lines 65+) and an optional protective layer on the surface of the metal foil opposite the thermoplastic adhesive (col 2, lines 36+). The thermoplastic adhesive (herein relied upon to read on the claimed "innermost layer") comprises any thermoplastic resin that adheres to the metal foil and is heat-sealable to the plastic battery housing (col 2, lines 5+). The metal foil is preferably aluminum (col 3, example 2). The protective layer (herein relied upon to read on the claimed base layer) is applied to the foil during the foil lamination process (col 2, lines 36+).

Chow does not teach that the aluminum foil should be conversion coated prior to lamination. However, Steele teaches a process for forming a chromium/phosphate protective conversion coating on metal surfaces such as aluminum (abstract). The

coating is applied by first applying a pre-treating solution comprising polyalkenylphenol and fluorine source (abstract). Then a conversion coating comprises a trivalent chromium component and a phosphate component (col 4, lines 24+). The coating protects the metal surface against corrosion and improved adhesion to coatings (col 2, lines 27+). The examiner notes that trivalent chromium phosphate results when phosphate and trivalent chromium are combined. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the conversion coating taught in Steele to both sides of the metal foil taught in Chow. The motivation for doing so would have been to increase the foil's corrosion resistance and adhesion to coatings.

Chow teaches that any thermoplastic resin that adheres to the aluminum foil and is heat-sealable to the plastic battery housing may be used as the thermoplastic adhesive (col 2, lines 1+), but does not teach that the thermoplastic adhesive may comprise polypropylene. However, Koike teaches a jacket for a battery wherein the jacket comprises an inside contacting layer made of polyolefin (abstract). Polyolefins are utilized because of their excellent heat-sealing properties and acid resistance (col 2, lines 44+). Suitable polyolefins include polypropylene (col 2, lines 55+). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize polypropylene as the thermoplastic adhesive taught in Chow because Koike teaches polypropylene has been used equivalently in the battery jacket art as inner heat-sealable layers of multi-layered battery jackets.

Chow also does not teach that an adhesive layer may be utilized between the thermoplastic adhesive and aluminum foil. However, Fitko teaches that carboxyl modified polypropylene resins can be utilized as adhesion promoters for laminating olefin resin to aluminum foil (col 1, lines 27+). Thus, it would have been obvious to one of ordinary skill in the art to utilize carboxyl modified polypropylene between the innermost layer and the aluminum foil layer of the laminate taught in Chow. The motivation for doing so would have been to increase the adhesion between thermoplastic adhesive and aluminum.

Chow also does not teach the method in which the protective layer, the carboxyl modified polypropylene layer, and the thermoplastic adhesive should be applied to said aluminum layer. However, Kawahara teaches that aluminum may be laminated to thermoplastic resin layers by various known methods such as hot melting, extrusion coating, sandwich lamination or dry lamination using an adhesive (col 14, lines 65+). If the adhesive is a thermoplastic resin, it can be co-extruded with the thermoplastic resin in the form of a laminate film and heat fused to the aluminum substrate. The film is passed through rolls and heated (col 14, lines 65+). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize any of the method disclosed in Kawahara to attach the protective layer, the carboxyl modified polypropylene layer, and the thermoplastic adhesive to the aluminum foil taught in Chow. The motivation for doing so would have been that such methods are known in the art for adhering thermoplastic films to aluminum foils. Thus, said methods are

understood to be cost effective and could be practiced without modifying known apparatus.

17. Claims 101 and 102 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow et al (US 5,134,046) in view of Steele et al (US 5,242,714), Koike (US 4,664,994), Fitko et al (US 4,156,672), and Kawahara et al (US 4,828,136), as applied to claims above, and further in view of Kiriazis (US 6,083,336).

The references are relied upon as above, but do not teach that the polyolefin layer may be surface treated prior to lamination. However, Kirazis teaches that the surface of an olefin is preferably treated with an ozone treatment immediately before lamination (col 1, lines 38+). Said treatment improves the adhesion of the olefin. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to ozone treat the adhesive layer of the laminate taught in Chow immediately before its applied to the aluminum layer in order to improve adhesion between said layers.

18. Claims 91, 92, and 96 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow et al (US 5,134,046) in view of Steele et al (US 5,242,714), Koike (US 4,664,994), Aoyama et al (US 4,597,818), and Kawahara et al (US 4,828,136).

Chow teaches a method of making a metallic foil covering for a battery (abstract). The foil comprises a metallic foil, a thermoplastic adhesive film, (col 1, lines 65+) and an optional protective layer on the surface of the metal foil opposite the thermoplastic adhesive (col 2, lines 36+). The thermoplastic adhesive (herein relied upon to read on

the claimed "innermost layer") comprises any thermoplastic resin that adheres to the metal foil and is heat-sealable to the plastic battery housing (col 2, lines 5+). The metal foil is preferably aluminum (col 3, example 2). The protective layer (herein relied upon to read on the claimed base layer) is applied to the foil during the foil lamination process (col 2, lines 36+).

Chow does not teach that the aluminum foil should be conversion coated prior to lamination. However, Steele teaches a process for forming a chromium/phosphate protective conversion coating on metal surfaces such as aluminum (abstract). The coating is applied by first applying a pre-treating solution comprising polyalkenylphenol and fluorine source (abstract). Then a conversion coating comprises a trivalent chromium component and a phosphate component (col 4, lines 24+). The coating protects the metal surface against corrosion and improved adhesion to coatings (col 2, lines 27+). The examiner notes that trivalent chromium phosphate results when phosphate and trivalent chromium are combined. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the conversion coating taught in Steele to both sides of the metal foil taught in Chow. The motivation for doing so would have been to increase the foil's corrosion resistance and adhesion to coatings.

Chow teaches that any thermoplastic resin that adheres to the aluminum foil and is heat-sealable to the plastic battery housing may be used as the thermoplastic adhesive (col 2, lines 1+), but does not teach that the thermoplastic adhesive may comprise polyethylene. However, Koike teaches a jacket for a battery wherein the

jacket comprises an inside contacting layer made of polyolefin (abstract). Polyolefins are utilized because of their excellent heat-sealing properties and acid resistance (col 2, lines 44+). Suitable polyolefins include polyethylene (col 2, lines 55+). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize polyethylene as the thermoplastic adhesive taught in Chow because Koike teaches polyethylene has been used equivalently in the battery jacket art as inner heat-sealable layers of multi-layered battery jackets.

Chow also does not teach that an adhesive layer may be utilized between the thermoplastic adhesive and aluminum foil. However, Aoyama teaches that an acid modified polyethylene may be utilized as an adhesive between polyethylene and aluminum (see example 4). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize acid modified polyethylene the tie layer between the thermoplastic adhesive layer and the aluminum foil taught in Chow. The motivation for doing so would have been to increase the adhesion between thermoplastic adhesive and aluminum.

Chow also does not teach the method in which the protective layer, the carboxyl modified polypropylene layer, and the thermoplastic adhesive should be applied to said aluminum layer. However, Kawahara teaches that aluminum may be laminated to thermoplastic resin layers by various known methods such as hot melting, extrusion coating, sandwich lamination or dry lamination using an adhesive (col 14, lines 65+). If the adhesive is a thermoplastic resin, it can be co-extruded with the thermoplastic resin in the form of a laminate film and heat fused to the aluminum substrate. The film is

passed through rolls and heated (col 14, lines 65+). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize any of the method disclosed in Kawahara to attach the protective layer, the carboxyl modified polypropylene layer, and the thermoplastic adhesive to the aluminum foil taught in Chow. The motivation for doing so would have been that such methods are known in the art for adhering thermoplastic films to aluminum foils. Thus, said methods are understood to be cost effective and could be practiced without modifying known apparatus.

19. Claims 93, 94, 98, and 99 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow et al (US 5,134,046) in view of Steele et al (US 5,242,714), JP 75037688B (herein referred to as Sanyo), Fitko et al (US 4,156,672), and Kawahara et al (US 4,828,136).

Chow teaches a method of making a metallic foil covering for a battery (abstract). The foil comprises a metallic foil, a thermoplastic adhesive film, (col 1, lines 65+) and an optional protective layer on the surface of the metal foil opposite the thermoplastic adhesive (col 2, lines 36+). The thermoplastic adhesive (herein relied upon to read on the claimed "innermost layer") comprises any thermoplastic resin that adheres to the metal foil and is heat-sealable to the plastic battery housing (col 2, lines 5+). The metal foil is preferably aluminum (col 3, example 2). The protective layer (herein relied upon to read on the claimed base layer) is applied to the foil during the foil lamination process (col 2, lines 36+).

Chow does not teach that the aluminum foil should be conversion coated prior to lamination. However, Steele teaches a process for forming a chromium/phosphate protective conversion coating on metal surfaces such as aluminum (abstract). The coating is applied by first applying a pre-treating solution comprising polyalkenylphenol and fluorine source (abstract). Then a conversion coating comprises a trivalent chromium component and a phosphate component (col 4, lines 24+). The coating protects the metal surface against corrosion and improved adhesion to coatings (col 2, lines 27+). The examiner notes that trivalent chromium phosphate results when phosphate and trivalent chromium are combined. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the conversion coating taught in Steele to both sides of the metal foil taught in Chow. The motivation for doing so would have been to increase the foil's corrosion resistance and adhesion to coatings.

Chow also does not teach that the thermoplastic adhesive may comprise ethylene rich polypropylene. However, Sanyo teaches an adhesive agent for bonding polyolefin articles to metal surfaces (abstract). Said adhesive agent comprises propylene-ethylene copolymer having 2-15wt% ethylene. It would have been obvious to one of ordinary skill in the art to utilize the terpolymer as the thermoplastic layer taught in Chow because Chow teaches any thermoplastic layer which adheres to the metal foil and is heat sealable to the plastic battery.

Chow also does not teach that an adhesive layer may be utilized between the thermoplastic adhesive and aluminum foil. However, Fitko teaches that carboxyl

modified polypropylene resins can be utilized as adhesion promoters for laminating olefin resin to aluminum foil (col 1, lines 27+). Thus, it would have been obvious to one of ordinary skill in the art to utilize carboxyl modified polypropylene between the innermost layer and the aluminum foil layer of the laminate taught in Chow. The motivation for doing so would have been to increase the adhesion between thermoplastic adhesive and aluminum.

Chow also does not teach the method in which the protective layer, the carboxyl modified polypropylene layer, and the thermoplastic adhesive should be applied to said aluminum layer. However, Kawahara teaches that aluminum may be laminated to thermoplastic resin layers by various known methods such as hot melting, extrusion coating, sandwich lamination or dry lamination using an adhesive (col 14, lines 65+). If the adhesive is a thermoplastic resin, it can be co-extruded with the thermoplastic resin in the form of a laminate film and heat fused to the aluminum substrate. The film is passed through rolls and heated (col 14, lines 65+). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize any of the method disclosed in Kawahara to attach the protective layer, the carboxyl modified polypropylene layer, and the thermoplastic adhesive to the aluminum foil taught in Chow. The motivation for doing so would have been that such methods are known in the art for adhering thermoplastic films to aluminum foils. Thus, said methods are understood to be cost effective and could be practiced without modifying known apparatus.

Said references are understood to read on the multilayer structure of claims 98 and 99 wherein all the layers of the multilayer structure comprise the same ethylene-rich random polypropylene resin. In such an instance, the claims are not patentably distinct from a laminate comprising the single ethylene-rich random polypropylene resin layer taught by the references.

Response to Arguments

Applicant notes that claim 77 has been amended to state that the chemical conversation coating is formed from a an aqueous solution containing a mixture of phenolic resin, trivalent chromium fluoride compound, and phosphoric acid. The examiner has noted the change and has applied new art to meet said limitations.

Applicant further notes that claims 89 and 99 have been amended to comply with the first paragraph of 35 USC 112. The amendment is note, and the rejection has been overcome.

The examiner also agrees with applicant's assessment that the amendments to claims 89 and 102 are sufficient for overcoming the outstanding 35 USC 112 rejections. Applicant has deleted the limitations that did not have support in the original disclosure.

Applicants remarks with regards to Zumstein are noted, but are moot said reference is not relied upon to reject the claims.

Conclusion

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin R Kruer whose telephone number is 571-272-1510. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on 571-272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Kevin R. Kruer
Patent Examiner-Art Unit 1773